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ABSTRACT

Since listening plays such a large role in communication and learning, audio tapes can function in an important fashion in the design and delivery of instruction. In addition, recent research indicates that compressed audio tapes, in which speech is edited electronically by a sampling method so that the words-per-minute rate is increased without changing the pitch, volume or fidelity, contribute to increased instructional efficiency. Such tapes foster individualized instruction and allow material to be presented in less time, with no loss in learning, thus freeing both student and instructor time for other activities. Considering the facts that students spend from 40% to 90% of their class time listening, that listening skills can be taught and improved, that the use of compressed tapes can improve reading skills and that the necessary tape equipment is available at reasonable prices, educators should begin to make more use of this instructional medium. (PB)

LISTENING AND COMPRESSED SPEECH

Herun Arrasjid

Individualized instruction has become an important issue in the design of the instructional system. The satisfaction of the individual learners, the matching of their needs, interests and abilities, should be of foremost consideration. Education for the individual requires the application of varying methods and technology to achieve maximum learning. Learning economy can be improved by the application of technology to instruction. The present need for improved economy is evidenced by the intended compression of the baccalaureate program at State University of New York from four years into three beginning in 1972. Learning economy is related to listening economy.

We are born into a world of sound. Sound has been a medium for communication or for transferring information to others, carrying message to change human behavior. Transformation of information depends upon how accurately the message conveys the desired meaning. The message is central to the communication process during the event. The delivery of information is our means of helping students or others to reach educational goal.

"Listening is the aural recognition and discrimination of sounds." We selectively filter intended sounds and only these sounds are picked-up by the ear. When a message is decoded, listening occurs. Hearing occurs when sound is accepted without any interpretation.

Knowledge and experience are required to become a good listener. Listening is a psychological process involving the intellect and emotions, and a synthesis of many activities, including hearing and judgement. The learning of special skills and possession of certain abilities aid the listener. Readiness to listen, ability to focus attention on selected sounds, the ability to properly evaluate the medium, the willingness to disregard prejudice, concentration, and a positive attitude towards the message, are necessary to receive and decode the message to achieve maximum reception.

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Essensen stated, that:

The psychology of listening is predicated upon the concepts of attention and perception. When we listen we attend; we organize a maximum concentration of our sensory receptors upon the communicative stimulus consisting of audible (that is spoken word) and visible symbols (that is bodily action). Only after we attend can we perceive: we are aware of the stimulus symbols and of the objects conditions or relationship which they represent. When we both attend and perceive we respond. We manifest this response by some overt or covert muscular movement or glandular activity.

Listening as a process also includes the ability to discriminate among sounds and ideas, the ability to relate ideas, and the ability to comprehend the message. Listening is one of the central modes of communication. Speaking is another mode of transferring information, as a source of understanding. The rate of speaking influences learning through listening. It is known that in general, Brown found that listeners prefer a rate between 150 and 175 words per-minute.

The following is a discussion of related research in the area of listening and compressed speech.

Listening

The Third Mental Measurements Yearbook devoted 70 pages to available tests of reading ability yet makes no reference to a single test of listening ability. Only after 1917 was a test of listening ability constructed. Pratt found no more than 175 titles of learning studies up to 1956. Only about 50 of them can be classified as research.

Recently, the belief has arisen that listening skills can and should be taught. Results from Penfield study in the area of learning to listen showed that training was most effective at grades two and five, with very little impact at grades eight and eleven.

In Lewis study, no significant differences in listening performance have been found between control group and experimental groups which had instruction in auding. But in Taylor's studies gains in students listening efficiency have been noted even after brief exposure to listening exercise. Kevin found that systematic instruction in listening comprehension benefited all intermediate grade students. As report by Wilkinson various investigators have found in almost all cases that experimental groups of college freshmen who have received systematic training have achieved significantly higher scores on listening comprehension tests.

Wilkinson found that elementary school students spend more than one-half of their school day listening, and high school students range as high as 90%. The undergraduate students spend about 42 percent of the time listening. Nolan found that typical elementary students learn the same whether they listen or read, while high school students learn a little more by reading, but not much more, and listening to be 150 to 360 percent more effective than reading to master the same content.

Compressed Audio-tape

Only in recent years have educators and researchers given their attention to the area of listening. A great increase has occurred in the number of studies on aural communication through the utilization of instructional technology and on various audio techniques of transferring information to others.

Many studies of the application of audio-tape for the improvement of listening skills have been done at the elementary and high school levels, but only a few at the college level. Presentation by audio-tape has been further developed to include the speeded-up audio-tape by deletion of tape segments at intervals resulting in decreased playback time.

The audio-tape is edited electronically so that brief regularly spaced segments of the tape are discarded. This sampling technique had been used in a variety of studies regarding improving learning economy and instruction.

Foulke stated that:

... It has been found that if the discarded segments are brief enough, the listener is not aware of their absence, and what he hears is speech that sounds normal in all respects except that the word rate has been increased.

Current studies of the compressed audio-tape, such as those done by (Foulke and Sticht, Short, George, Sticht), made possible by improved technology, have shown compressed audio-tape's potential for improving learning economy. The compressed audio-tape refers to speech which is edited electronically by the sampling method so that the words-per-minute rate is increased without change in pitch, volume level, or fidelity. Use of the compressed audio-tape could make a considerable contribution towards achieving greater learning economy and educational economy by shortening information presentation time. Information in the process of education is not an end in itself, but a means of achieving the goals of education. However, transference of information has taken most of the time of the instructor as well as the learner. Although available as an instructional resource for sixteen years since 1956 compressed audio-tape has had little impact on the educational system. Compressed audio-tape, as a channel may affect the total communication outcome. The presentor expects the compressed audio-tape will be successful as a communication channel.

Harwood's study showed no significant difference in listen ability of four words per-minute rates of presentation. McLain and Foulke found a slight but statistically significant advantage when a listening selection compressed by the sampling method was compared with the speed changing method. Two studies, Foulke and Sticht; and the other study by Orr and Friedman, found no sex related differences in listening comprehension for word rates ranging from 174 to 475 words per-minute. Goldhaber and Weaver found scores of male listeners were significantly higher than the scores of female listeners at all rates of presentation, 175, 325, 375, and 425 words per-minute, and at all three levels of difficulty.

Foulke and Sticht found that listening comprehension declines at a slow rate as word rate is increased, until a rate of approximately 275 wpm is reached, and a faster rate thereafter. The work of Fairbanks showed the strength of the sampling technique, Sticht and others have shown many used of compressed audio-tape without a loss in achievement.

The current studies have established evidence of the value of new innovation in the application of instructional technology at the college level. The results of studies with the compressed audio-tape technique confirmed its positive effect on the reduction of learning time and advanced the position that the compressed audio-tape techniques may significantly broaden an individual's capacity for increased learning economy, especially the fast learner with high listening ability.

Implications of the Compressed Tape

The compressed audio-tape could be applied where the lecture is the main instructional method. This could leave the instructor and the students time to pursue other areas of interest. Compressed audio-tape is best used for explaining general ideas rather than specific terms since background knowledge is necessary before listening to the compressed audio-tape and vocabulary is one variable.

The type of information given would also effect the successful use of the compressed audio-tape. Compressed audio-tape may not be suitable for poetry readings, to teach foreign languages, or for grammar instruction. Compressed audio-tape is good for teaching history because the content of the information would probably be general in nature and not technical.

Use of compressed audio-tape would allow students to make-up missed lectures, to do remedial listening, or to replay for increased comprehension of the lecture.

The compressed audio-tape along with performance objectives might extend materials to improve peak comprehension levels.

A two hour class lecture could be compressed in the form of cassette tape into a one and one-half hour delivery, with no apparent loss--but a gain in comprehension.

The compressed audio-tape might be applied to improve reading. One study by Goldstein and another study by Orr, Friedman and Williams found a significant positive correlation between reading rate and the ability to comprehend accelerated speech. Practice in listening to accelerated speech improved subjects' reading rate.

Compressed audio-tape can also be applied to improve listening skill of college students. Persons with highly developed listening skills would probably benefit most.

When an instructional systems package for individualized or group instruction is required, the compressed audio-tape along with performance objectives could become an alternative instructional method. Short's study showed students spent only 50% more time listening to the compressed audio-tape when compared to 100% more time listening to uncompressed audio-tape. Perhaps nothing else is needed with the exception of an evaluation form for feedback. The instructional systems package should be field tested and analyzed for validity.

Compressed audio-tape might be applicable for individualized instructions through programmed instruction. Highly skilled listeners with or without training in the compressed audio-tape could be an additional variable of program technique.

The rate of compression should be considered as a means for achieving economy in space and time in an audio storage retrieval system. The electronic retrieval system is already making contributions with regular speech audio-tape. Compressed audio-tape as well could be directly dialed from classroom, learning center, dormitories, homes and in fact anywhere.

Since an instant audio-cassette duplicator and audio-cassette playback machine are available, reasonably priced, the compressed audio-tape can be easily duplicated so that this medium can be accessible for many students.

McLuhan stated, "The phonograph is the music hall without walls, the movies, radio and TV are classrooms without walls." It could also be said, the audio-cassette with compressed speech is a learning center with open walls in instant time.

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